

ANIMAL KEEPER'S FORUM

The Journal of the
American Association of Zoo Keepers, Inc.

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August 2012 Volume 39, No. 8



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Animal Keepers' Forum is published monthly by the American Association of Zoo Keepers, Inc., 3601 S.W. 29th Street, Suite 133, Topeka, KS 66614-2054. Ten dollars of each membership fee goes toward the annual publication costs of *Animal Keepers' Forum*. Postage paid at Topeka, KS.

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MISSION STATEMENT

(Revised April, 2009)

American Association of Zoo Keepers, Inc.

The American Association of Zoo Keepers, Inc. exists to advance excellence in the animal keeping profession, foster effective communication beneficial to animal care, support deserving conservation projects, and promote the preservation of our natural resources and animal life.

ABOUT THE COVER

This month's cover features a toucan barbet (*Semnornis ramphastinus*) photographed on the western slope of the Andes Mountains at Refugio Paz de Aves, Ecuador. This species is listed as "Near Threatened" by the IUCN due to habitat loss and collection for the pet trade. It is a Chocó endemic found only in the cloud forests of northwest Ecuador and Columbia. In the past, toucan barbets were grouped with other barbets, but recent DNA-studies indicate that the New World barbets are more closely related to the toucans. Therefore, toucan barbets, and the prong-billed barbet have been placed in their own separate family, *Semnornithidae*. According to wikipedia.org/wiki/Toucan_Barbets, "The Toucan Barbet is unusual among frugivorous birds in that it breeds cooperatively, with several helpers aiding the dominant breeding pair with incubation and raising the young." In the zoo world, toucan barbets are listed as a phase out species by the Taxon Advisory Group.

This photo was taken by Tim Krynak, a Naturalist for Cleveland Metroparks. Tim and his wife Kathy, a former Animal Keeper at Cleveland Metroparks Zoo, sit on the Board of Directors of Reserva Las Gralarias in Ecuador. Reserva Las Gralarias is a 1063-acre wildlife sanctuary that protects cloud forest, hundreds of species of birds and other animals, orchids, bromeliads, ferns and ancient trees. To learn more about their ecotourism opportunities, visit reservalasgralarias.com.

Are you a former keeper, or do you know a former keeper who has an exciting or interesting occupation. We want to hear your story about life after zoo keeping and how your career as an animal keeper helped you in your new profession. Contact shane.good@aazk.org.

Articles sent to *Animal Keepers' Forum* will be reviewed by the editorial staff for publication. Articles of a research or technical nature will be submitted to one or more of the zoo professionals who serve as referees for *AKF*. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Lengthy articles may be separated into monthly installments at the discretion of the Editor. The Editor reserves the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed, appropriately-sized envelope. Telephone, fax or e-mail contributions of late-breaking news or last-minute insertions are accepted as space allows. **Phone (330) 483-1104; FAX (330) 483-1444; e-mail is shane.good@aazk.org.** If you have questions about submission guidelines, please contact the Editor. Submission guidelines are also found at: aazk.org/akf-submission-guidelines/.

Deadline for each regular issue is the 3rd of the preceding month.

Dedicated issues may have separate deadline dates and will be noted by the Editor.

Articles printed do not necessarily reflect the opinions of the *AKF* staff or the American Association of Zoo Keepers, Inc. Publication does not indicate endorsement by the Association.

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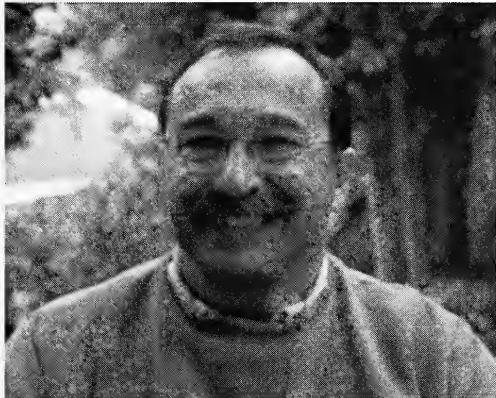
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FROM THE PRESIDENT

Surveying the Chapter Presidents

Much of our success within the Association results from effective communication. In fact, it is so important, that we have made it an integral part of our mission. The Association communicates with the membership, the membership communicates with each other and the membership communicates with the Association. It's that simple. This year, your Board of Directors has made strides in facilitating better communication, beginning at the Chapter level. Beginning with a survey directed to the Chapter leadership, last January, AAZK sent out a basic ten question survey with an expectation of finding out much more about how Chapters operate. With over 60% participation, the results were enlightening. The information that you provided will help the Association understand your needs as a Chapter and ultimately provide better service to the membership. The following questions were submitted to the Chapter Presidents (I have included top responses):



1. How many National Members are in your Chapter? **42% stated 10-15 members**
2. How often does your Chapter rotate officers? **50% stated every two years**
3. Does your Chapter receive support from your zoo or institution? **62% indicated that their institution provided a meeting place**
4. My zoo or institution is aware of how AAZK Conferences benefit zoo keepers. **62% indicated that their management staff is aware of AAZK as a professional organization**
5. Our Chapter excels at: **56% indicated fund raising events**
6. My Chapter understands that AAZK and Chapters are business partners. **62% affirmed this statement**
7. I receive the Constant Contact® Newsletter to AAZK Chapter Leaders. **48% indicated that they received the Chapter Newsletter**
8. I am interested in becoming more involved with National AAZK. **50% indicated not very likely; 24% indicated interest as a committee member**
9. Where do you receive information about National AAZK activities and opportunities? **98% indicated that the AKF was their primary source**
10. One of our goals as a Zoo Keeper organization is to prevent you from having to "reinvent the wheel." How likely are you to sign up and use an AAZK Chapter Leader's Listserve? This list-serve would provide you all the opportunity to post questions or answer queries from other Chapters. **66% declared an interest in a listserv for Chapter Presidents**

Full details of the survey can be found on the Members Only Area at aazk.org/members/index.php

Satisfaction vs. Engagement

There is a difference between job satisfaction and engagement in the workplace. This applies on a membership level, as well. The distinction between engagement and satisfaction is profound. An engaged member is one who feels that they are doing something valuable and that participating makes a difference in their organization and profession. While we may run an Association that produces satisfactory results, engagement is what we should seek at the very least, on a Chapter level. With that in mind, continue reading this summary with the understanding that striving for engagement in addition to satisfaction will help solidify Chapter-National relations and lead us towards the vision of AAZK.

The Chapter

The average AAZK Chapter has between 10 and 15 National members with no indication of how many local Chapter members are not National AAZK members. Most Chapters rotate officers every two years but have difficulty finding fresh leadership. In addition, Chapters receive some form of support from their institution. However, they are met with fundraising restrictions in some cases.

While most institutions are aware of the professional nature of AAZK, less than half regularly send one or more to AAZK conferences. Most institutions who do send members, expect some form of reporting when they return. This is where the benefit of flash drive media will help improve these numbers greatly. Currently, keepers attend AAZK conferences and return to their home institution with a flash drive full of electronic materials from paper sessions and workshops. Conference attendees should be encouraged to go back to their institutions and share this information. AAZK has established a priority to improve professional development opportunities by increasing skills-based and hands-on workshops at our conferences. To supplement that focus, we are currently working at establishing distance-learning opportunities for those who cannot attend conferences.

Chapter Activities

While most Chapters expressed excelling at fundraising, fewer included Bowling for Rhinos (BFR) as their main focus for charitable contributions. As I speak with more and more Chapters, I am learning that Chapters spend an enormous amount of time on fundraising. This spring, we were fortunate to have a business student from Whelan University go through our re-charter packets and itemize how much non-BFR fundraising our Chapters do. The results were astonishing and said much about our ability to fund raise for worthy causes. Last year, AAZK Chapters raised over \$529,000, more than half of which helped our flagship conservation program, BFR. Nonetheless, we are still working towards 100% Chapter participation for BFR.

While Chapters rated themselves high at raising money, only 18 percent felt that they excelled at professional development. The low scores in professional development, communication, and networking indicate that Chapters may need assistance in becoming more proficient in these areas. Institutions may perceive Chapters more as fundraising groups than professional development alternatives for keepers. Generating a model for Chapters, rather than leaving them to create their own pathway may be something that can be pursued in the future. For instance, as new Chapters are formed and subsequently left to reinvent the wheel, I propose that we designate the CHAPTER OF THE YEAR (COTY) as the mentor Chapter, providing guidance to any newly formed Chapter that emerges during their term. Given the right kind of template, the COTY could ensure that the new Chapters had a strong understanding of how Chapters should work, bearing in mind that there is always a degree of flexibility.

Connecting with National

The relationship between National and Chapters can sometimes appear to be distant. While only 62% of Chapters stated that they understood the relationship between National and Chapters, only 30% surveyed agreed that we are like-minded. At National, we are hoping to change that. When I was a Chapter President, I don't think I clearly understood the roles between National and Chapters. Much of the current direction that the Association is taking is aimed at remedying that. I think Executive Director, Ed Hanson summed it up best when he wrote back in the Message from the Director in the January 2011 AKF:

"...AAZK realizes that we sometimes treat our Chapters as subordinates, not partners. I give you my word - this year AAZK will be granting Chapters a voice in the way the Association operates. While the AAZK Directors represent the members by election, Chapters do not have a voice. We're working to change that."

As your Board of Directors, we need to find more and more ways in which we can change that subordinate perception and engage our Chapters as full business partners. This will require perfection in communication on our part. Our current communication strategies are designed to engage you all as partners, keeping you informed and giving you a voice and we are working diligently to find ways to give Chapters a better voice within the Association.

From Chapter leadership to Participation on a National Level

When asked if there was an interest in becoming more involved with National AAZK, only 6% indicated that there was an interest in serving as a Board member. While 50% specified no interest in serving, 24% showed an interest in serving as a committee member. Service at the committee level is one of the best ways to make an impact not only on the Association and our members, but also on your profession as well. If there is that much interest in being on committees, are we doing enough to cultivate and harvest that interest? Talent management is a very sustainable practice in any organization. Becoming involved on a committee level is a form of professional development but also ranks as a membership resource. I view this section as our future investment in the leadership of this Association.

Communication is expressed in a variety of ways: directed, interactive, and receptive skills are employed at various times for effective results. As an Association, I think that we excel in the direct form of communication. We communicate successfully through our e-blasts, web page, members only page, Constant Contact®, and even conferences. We are now beginning to develop our interactive skills through listserv use, social media, and direct communication with Chapter leadership. Surveys, as infrequent as they are, will help improve communication on the receptive level. Providing Chapters, leaders and even members to direct concern or rate performance is a much better way to learn about membership satisfaction than interpreting fluctuating membership retention rates and conference attendance.

The engagement of our membership begins at the Chapter leadership level but does not end there. It does, however, help drive the perception of who National AAZK is and what we do for our membership. The increase of engagement in the workplace is a prime example of how increasing productivity stems from the empowerment of employees. In our case, improving relationships with our membership on the Chapter level will help to further connect our membership. Effective communication can produce positive results where customer satisfaction is concerned and can help dispel misinformation that often leads to a negative view of the establishment.

"If you build it, they will come." That phrase was coined from the movie "Field of Dreams." It emphasized that the structure itself will generate consumer interest but it never addresses how to keep them coming. Since 1967, AAZK has stood as the "field of dreams" for zoo keepers and animal

care professionals. With the advent of social media and the universal use of electronic media, we now have the tools needed to sustain our membership, reach out to more animal care professionals, and perfect the mission of our organization.

As our vision states:

AAZK will be the leader in the zoo and aquarium industry fostering professional development and personal connections that advance animal care, animal welfare and conservation.

On a final note, everything that we do as your Board of Directors, every decision that we make, and every direction that we turn, requires in some form, support from our membership. The cornerstone for this strong foundation is developing an effective communication strategy, in addition to providing the benefits of a professional development package. We can struggle with many things, we can be slow to produce results, but we cannot fail to communicate effectively, nor can we fail to establish membership engagement. Since this survey was generated, we have moved forward by initiating a listserv for Chapter Presidents providing your Chapters with an opportunity to communicate more efficiently with other Chapters. We are also working on providing professional development opportunities to our members who are not able to attend conferences. Our success will be measured by your participation.

In his last communiqué as National President (September, 2011), Shane Good referenced the Board's improved communication strategy and direct relationship to our membership by stating that "none of that matters if the communication isn't reciprocated...Be the voice that shapes your profession."

As your Board of Directors, we strive to serve in the best interest of the membership and the Association and in doing so; we look forward to hearing back from you.

As always, my door is open. E-mail me your thoughts at bob.cisneros@aazk.org.

Bob Cisneros



THANK YOU!

The AAZK Board of Directors and Staff sends their sincere appreciation to the Indianapolis AAZK Chapter for sponsoring this month's issue of the *Animal Keepers' Forum*. The Chapter made a special contribution designated for the *AKF* with their re-charter materials. It is the special contributions of our Chapters that allow our Association to continue to grow, expand your professional development opportunities, and

reaffirm our commitment to your flagship conservation programs. Our thanks goes out to the Indianapolis Chapter for sponsoring this month's *AKF*, and to all of the Chapters that support the Association throughout the year.

— AAZK ANNOUNCES NEW MEMBERS —

NEW COMMERCIAL MEMBERS

Granite Industries, Archbold (OH)

NEW PROFESSIONAL MEMBERS

Kerry Dobson, The Maritime Aquarium, Norwalk (CT)

Sara Worthley, Rosamond Gifford Zoo, Syracuse (NY)

Laura Roach, Busch Gardens (VA)

Allison Ballentine, Western North Carolina Nature Center (NC)

Katy Strobl, Gatorland (FL)

Dominick Piazza, Brevard Zoo (FL)

Kimberly Shields, Grizzly & Wolf Discovery Center, W. Yellowstone (MT)

Caitlin Miller, Grizzly & Wolf Discovery Center, W. Yellowstone (MT)

Michael R. Manning, Grizzly & Wolf Discovery Center, W. Yellowstone (MT)

April Zimpel, Houston Zoo, Houston (TX)

Rhonda Alexander, Pueblo Zoo, Pueblo (CO)

Amber D. Hale, Bearizona Wildlife Park

Christa Klein, Sacramento Zoo, Sacramento (CA)

Jennifer Hansen, Honolulu Zoo, Honolulu (HI)

Malia Davis, Honolulu Zoo, Honolulu (HI)

Paulette Greenfield, Honolulu Zoo, Honolulu (HI)

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Tina Hutchison, Glen Mills (PA)

Vernon N. Kisling, Jr., High Springs (FL)

RENEWING INSTITUTIONS

Antwerp Zoo, Antwerpen (Belgium)

Celeste Lombardi, Columbus Zoo & Aquarium, Powell (OH)

Vicky Keahey, In-Sync Exotics, Wylie (TX)

COMING EVENTS

Post Your Upcoming Events here — e-mail shane.good@aazk.org

September 9-13, 2012

4th International Congress on Zookeeping

Sponsored by Wildlife Reserves Singapore/Singapore Tourism Bureau. Theme: "Many Voices, One Calling". For info on sponsorship or exhibit opportunities e-mail eo@aszk.org.au. Check the ICZ website iczoo.org for latest news/information.

September 19-25, 2012

The Association of Zoo Veterinary Technicians 32nd Annual Conference

Location: Lowry Park Zoo in Tampa, Florida. For more information visit azvt.org.

September 23-27, 2012

AAZK National Conference

Hosted by the Rosamond Gifford Zoo and the Rosamond Gifford Zoo AAZK Chapter in Syracuse, NY. For more information see rgzaazk.org.

October 12-15, 2012

From Good Care to Great Welfare: A Workshop Designed for Animal Care Professionals

For information contact: Elizabeth Arbaugh, Animal Welfare Manager, Detroit Zoological Society, Tel: 248-398-0903 x3643, E-mail: Elizabeth@dzs.org or visit czaw.org.

November 2-4, 2012

New World Primate Husbandry Workshop

The New World Primate Taxon Advisory Group (NWPTAG) and the Palm Beach Zoo are hosting a New World Primate Husbandry Workshop to take place November 2-4, 2012. This will be a combined callitrichid and cebid husbandry workshop, taking the place of the traditional callitrichid workshop held in years past. Some of the topics to be covered will include general husbandry, training and enrichment, natural history, capture and restraint methods, and mixed species exhibits. The deadline for registration is August 31, 2012. For more information including registration forms, please contact Dr. Stephanie Allard at sdampier@palmbeachzoo.org or Michelle Farmerie at mrfarmerie@aol.com.

November 5-8: The 2012

Elephant Managers Association Conference

"Trunks and Palms" will be hosted by the Santa Barbara Zoological Gardens in Santa Barbara, CA. The Pre-conference trip will be hosted by the Los Angeles Zoo in Los Angeles, CA on Monday, November 5th followed by a cocktail party at the contemporary waterfront Cabrillo Art Center that evening. The conference will include two and half days of presentations followed by a Zoo Day at the Santa Barbara Zoo. The conference will conclude with a California cuisine banquet and auction. Beachfront accommodations and presentations will be held at the Hyatt of Santa Barbara: santabarbara.hyatt.com. To register or submit abstracts please visit: sbzoo.org under events-EMA. For additional information please e-mail lwilson@sbzoo.org.

December 3 - 7, 2012

Training and Enrichment Workshop for Zoo and Aquarium Animals

Hosted by Moody Gardens in Galveston, TX, Active Environments and Shape of Enrichment are proud to present the Sixth Training and Enrichment Workshop for Zoo and Aquarium Animals. This unique five-day Workshop is designed for keepers, aquarists, managers, supervisors, curators, and veterinarians working with all species of animals held in zoos, aquariums, rescue centers, and sanctuaries. The Workshop will present an array of topics relating to the behavioral management approach to caring for captive animals, with a focus on environmental enrichment, positive reinforcement training techniques, and the problem-solving process. For more information e-mail dolsen@modygardens.com or go to enrichment.org.

National Conferences



AZA

2012 - Phoenix, AZ - September 8-13
2013 - Kansas City, MO - September 7-12
2014 - Orlando, FL - September 12-17

aza.org

AAZK

2012 - Syracuse, NY - September 23-27
2013 - Asheboro, NC - September 22-26
2014 - Orlando, FL - September 8-12

aazk.org

Stay informed on the latest developments within your Association and our conservation partners! Check us out today at [Facebook.com/AAZKinc](https://www.facebook.com/AAZKinc)



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THE SCOOP

The Snow Leopard Trust is looking for a Keeper attending this year's AAZK Conference hosted by the Rosamond Gifford Zoo in Syracuse, who might be able to staff a booth on behalf of the Snow Leopard Trust and sell some of our products. We totally understand that Keepers go to this conference to participate in the talks and activities, so that the booth may not be able to stay open the entire time, but even if you could just sell items during the breaks or down time, that would be wonderful. The Trust is willing to cover a portion of the conference fees as a way of saying thank you for your help. Please contact Marissa Niranjan at marissa@snowleopard.org or by calling 206-632-2421 for more information.

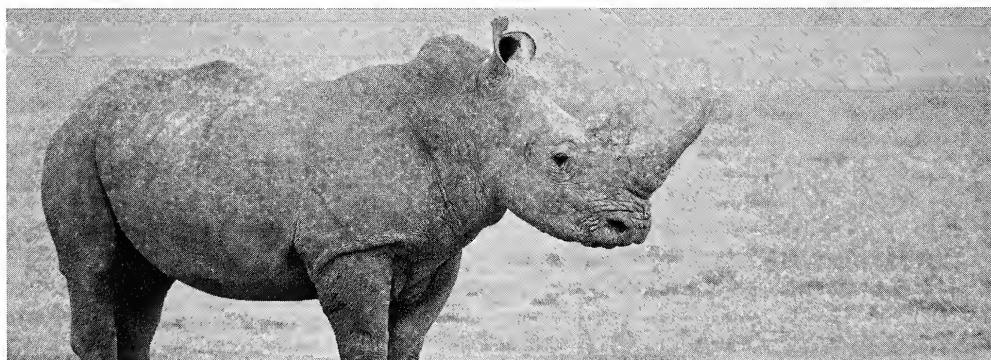


Snow Leopard Trust

Congratulations to the 2012 Recipient of the Bowling for Rhinos Conservation Resource Fund



Please join us in congratulating the Lapalala Wilderness Rhino Project on being the 2012 recipient of the Bowling for Rhinos Conservation Resource Fund. This fund, established with funds generated through Bowling for Rhinos, is made available annually to projects dedicated to rhino conservation. \$2300.29 will be awarded to fund a three-dimensional project focused on the conservation of white rhinoceros in Lapalala Wilderness Reserve in South Africa. The first dimension will focus on establishing reproductive profiles of female white rhino using hormonal data collected from fecal samples. Secondly, grasses of the reserve will be examined for the presence of phytoestrogens, and the possible effects of these chemicals on reproductive success of both captive and wild white rhino will be assessed. The third dimension is an outreach program that enables school children and their teachers to learn about rhinos and their conservation in an interactive environment. We wish the Lapalala Wilderness Rhino Project success in these worthy endeavors, and thank the AAZK membership for making this fund possible through continued commitment to Bowling for Rhinos.





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World's Top Animal Conservation Award Goes to PBI Scientist

Polar Bear Champion Steven Amstrup Awarded 2012 Indianapolis Prize

"Lord of the Arctic" May Survive Due to Efforts of Dedicated Scientist

June 14, 2012 PRESS RELEASE from The Indianapolis Prize



WASHINGTON – His search to understand the Lord of the Arctic, (*Ursus maritimus*), the polar bear, has taken him to one of the harshest environments in the world – a frozen seascape where temperatures plummet below zero and the sun isn't seen for months on end. Dr. Steven C. Amstrup, the most influential person working on polar bear conservation today, has been selected from among a group of six outstanding finalists to receive the 2012 Indianapolis Prize – the world's leading award for animal conservation.

Hope that the iconic and endangered polar bear may survive is due in large part to Dr. Amstrup and his team and their groundbreaking studies that resulted in the listing of polar bears as a threatened species because of global warming. Amstrup's three decades of polar bear research and his unwavering conviction that solutions can and must be found are creating new optimism that polar bears can be saved from extinction. It is in recognition of his life-long work to transform the world's understanding of and efforts to save polar bears that Steven C. Amstrup, chief scientist for Polar Bears International, has been named the recipient of the Indianapolis Prize. The biennial Prize includes an unrestricted award of \$100,000 and the Lilly Medal, which will be presented at the Indianapolis Prize Gala ceremony presented by Cummins, Inc. on Sept. 29, 2012, at the JW Marriott Hotel in Indianapolis.

In 2007 Amstrup led an international team of researchers to assess the likely future impact of global



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warming on polar bears. The group's nine reports, relied on by the Secretary of the Interior, became the basis for the 2008 listing of polar bears as a threatened species under the Endangered Species Act. This listing is significant because the polar bear is the first species – and only species to date – to be listed on the basis of threats posed by global warming.

Early in his career as polar bear research leader for the U.S. Geological Survey, Amstrup solved the decades-old mystery of where Alaskan polar bears go to give birth to their young. His finding that more than half of the mother bears denned on drifting ice floes, which are highly susceptible to rising temperatures, was a prescient indication of the vulnerability of polar bears to a warming world. This and other discoveries regarding the polar bear's dependence on sea ice led to Amstrup's 2007 projection that two-thirds of the world's polar bears could disappear by midcentury, and all could be lost by the end of the century, if greenhouse gas emissions continue on the present course. Those discoveries also showed that changing our greenhouse gas emissions path could save polar bears.

"Steven's fieldwork in the Arctic opened the door to understanding that the deterioration of the polar bear population is at our doorstep, while verifying that this is not an irreversible situation," said Robert Buchanan, President/CEO, Polar Bears International. "His passionate outreach has helped the world understand how sea ice losses from a warming climate threaten polar bear survival. His message is one of hope and determination to have future generations see polar bears roam free in the Arctic."

"Steve Amstrup is widely regarded as the most important and influential scientist working on polar bear conservation today," said Michael Crowther, President and CEO of the Indianapolis Zoo. "By bringing greater awareness to the polar bears' plight and plausible solutions, he has created a lifeline for the entire species."

Born in Fargo, N.D., Amstrup received his bachelor's degree from the University of Washington in Seattle, his master of science from the University of Idaho in Moscow, and his doctorate from the University of Alaska in Fairbanks. Amstrup currently resides in Kettle Falls, Wash., with his wife Virginia, and maintains electronic connection with the Polar Bears International office in Bozeman, Mont.

The 2010 biennial Indianapolis Prize was awarded to legendary elephant advocate Iain Douglas-Hamilton. His accomplishments span decades and continents, bringing global attention to the issue of blood ivory and inspiring others to join the battle against poachers and traders.

EDITOR'S NOTE:

The Indianapolis Prize was initiated by the Indianapolis Zoo as a significant component of its mission to empower people and communities, both locally and globally, to advance animal conservation. This biennial award brings the world's attention to the cause of animal conservation and the brave, talented and dedicated men and women who spend their lives saving the Earth's endangered animal species. The recipient also receives the Lilly Medal, an original work of art that signifies the winner's contributions to conserving some of the world's most threatened animals. The 2010 Indianapolis Prize was awarded to Iain Douglas-Hamilton, founder and CEO of Save the Elephants and legendary conservation figure. Additional Prize predecessors include Dr. George Archibald, the co-founder of the International Crane Foundation, and Dr. George Schaller, the world's pre-eminent field biologist and vice president of science and exploration for the World Conservation Society. The Indianapolis Prize has received support from the Eli Lilly and Company Foundation since its inception in 2006.

International Rhino Foundation Celebrates Critical Milestone for Sumatran Rhinos

By Susie Ellis, Executive Director, IRF

We are delighted to announce that Ratu gave birth to a healthy male calf, weighing between 60 and 70 lbs! The arrival of the calf, just named "Andatu" (meaning "Gift from God" in Bahasa, and also a combination of the name of his parents) is an auspicious beginning to the President of Indonesia's declaration of 2012 as International Year of the Rhino earlier this month, supported by numerous other rhino range countries. I'm pleased to be able to share here my own 'bird's eye view' of the blessed event here at the Sumatran Rhino Sanctuary. For me, this has been an incredible career highlight!

At about 11:00 p.m. on 22 June 2012, it became clear that Ratu had entered second-stage labor, with the embryonic sac just starting to emerge. It had been a long week up to this point - on Monday, Ratu was confined to a small boma area within the forest, with access to two maternity stalls. (For Ratu, it might have been the equivalent of moving from a four or five-bedroom house with acreage to a studio apartment...) She very much wanted to go back into her larger rain forest pen, but for her safety and that of the calf, she needed to be in a smaller area so that the birth situation could be managed in case she got into trouble. Ratu was exceedingly restless in the boma, pacing, chewing up rubber water bins, breaking up plywood barriers with her horn (barriers have been put up to make sure the tiny calf can't slip through the maternity stall rails). To keep her occupied, Ratu's keepers devised a variety of enrichment 'toys' ranging from logs to placing bananas in tree crevices and hanging browse in different areas of the boma, which worked like a charm. As delivery got closer, Ratu's appetite waned, and there was a noticeable difference in her behavior with her restlessness seeming to be more self - than environmentally-focused. One thing she did repeatedly was put her front legs up on trees or on the stall barriers, as if she were stretching. Perhaps this behavior is one way the mother helps get the calf into position for delivery, who knows?



Ratu with four day-old Andatu. Photo by Susie Ellis, International Rhino Foundation.

Because we wanted Ratu to be as calm as possible, only two Keepers, Dr. Dedi Candra, SRS Veterinarian and Collection Manager, Dr. Benn Bryant, Veterinarian at Taronga Conservation Society Australia and Cincinnati Zoo Keeper Paul Reinhart, who attended all three births at that facility, were allowed to be in the birthing area when the big moment arrived.

IRF had invested in a closed-circuit television system to allow continuous monitoring of the birthing area, placing four moveable cameras around the birthing area, as well as hand-held cameras. The rest of the SRS keepers, Inov (our Indonesia Liaison) and I watched the whole event together over the monitors at their quarters. It was an anxious few minutes when the calf emerged and before we could clearly see it moving about. But Dr. Candra later assured us that the calf had been breathing and moving right away, which we weren't able to immediately see in the darkness.

After the placenta was passed, it was whisked to the lab where I stood ready to process and freeze cells, as I was trained to do at the San Diego Zoo Center for Conservation Research a few weeks ago. These cells hopefully can be used to generate stem cells in the future, which may have a number of potential uses from curing diseases to helping promote reproduction. This is another way in which this birth can contribute new knowledge and tools potentially important to sustaining the future of the species. By 8 a.m., the samples were safely preserved in liquid nitrogen and I headed back to the main building - at about the same time the vets returned with ear-to-ear smiles that haven't left their faces since.

The story of this calf truly is an international success, in addition to a terrific 'girl-meets-boy' tale. This milestone has been achieved with the support and advice of numerous rhino experts across the globe. Andalas, the father, was born at the Cincinnati Zoo in 2001 and brought over to the Sumatran Rhino Sanctuary in 2007. Ratu wandered out of the forest in 2005 and was brought to the Sanctuary to keep her from harm. After many introductions, and two pregnancy losses, the pair finally has produced a calf.

IRF, our local partner the Rhino Foundation of Indonesia as well as the Indonesian Ministry of Forestry, which operates Way Kambas National Park, have been waiting for this moment since IRF planned and funded the construction of the sanctuary in 1998. This birth is another step forward in ensuring the future of the world's most endangered large mammal. The Sanctuary costs about \$225,000 to operate annually.

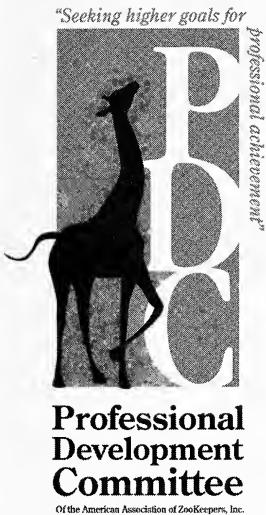
IRF is honored to play an important role in protecting rhinos both in Way Kambas and in Bukit Barisan Selatan National Parks. Sumatran rhinos exist only in protected areas where they are physically guarded from harm by Rhino Protection Units. Continuing this protection, plus advances in managed breeding, provide the best possible hope for the species' survival. With your help, we believe the Sumatran rhino population will again someday thrive.

There are fewer than 200 Sumatran rhinos living in Indonesia and Malaysia. Indonesia's population is seriously threatened by the continuing loss of its tropical forest habitat and the risk of hunting by poachers, who kill rhinos for their valuable horns. This is only the fourth birth in a managed breeding facility, the first in an Indonesian facility, and the first in an Asian facility in 124 years. Every successful birth is critical for the survival of the species, which runs the risk of extinction by the end of this century.

Susie Ellis, PhD
Executive Director, International Rhino Foundation
IRF is a Conservation Partner of AAZK, Inc. and a beneficiary of Bowling for Rhinos

Professional Development Committee: What are they up to now?

Ellen Vossekuil, Keeper III
Utah's Holger Zoo
Salt Lake City, UT



What is Professional Development?

The Professional Development Committee's mission is to provide continual resources for professional growth through leadership and educational opportunities for all National AAZK members. This article will talk specifically about the goals of PDC as they relate to educational opportunities.

The field of animal care has become increasingly complex in the last few decades. Keepers are expected to be on the forefront of many different disciplines. We must have a working knowledge of training and enrichment, nutrition, neonatal care, exhibit design, data collection, and public speaking and education. And that's in between all of our basic husbandry routine! While on-the-job training is an essential part of keeper education, part of being a professional in the field is to constantly update one's self on advances in animal care. Continuing education opportunities are variable among zoos, and this is where National AAZK can help.

In San Diego, the format of national conferences was shifted to allow more time for hands-on learning opportunities in the form of workshops. While paper sessions are incredibly useful for sharing experiences between zoos, more time was needed for general knowledge acquisition and problem-solving in smaller groups. Experts on various topics were gathered from the host institution and around the country, giving attendees the opportunity to learn directly from some of the leaders in the field.

This shift towards more workshops is part of a long-term goal of standardizing animal care through a national Keeper Certification. Currently, the level of training a keeper receives is incredibly variable between zoos. Some facilities have extensive staff training programs in place, while others don't have resources for more than the basics. By offering certification workshops at national conferences, keepers from any facility will have access to the latest information in the field. Another goal of the program is to be able to train keepers to hold their own classes at their



facilities, thus allowing zoos with minimal resources to stay at the forefront of progressive animal care. While these plans are still in the very beginning phases, the potential is exciting!

The new conference workshop format will continue to be reflected in Syracuse in 2012. PDC is currently in the process of finalizing workshop details for Syracuse. We've decided on subject matter and found instructors, many on the recommendation of Rosamond Gifford AAZK. Future offerings at each conference will be a mixture of new workshops (to keep it fresh for those who attend year after year) and repeat workshops (to allow new attendees to get the same information regardless of which conference they attend).

Future conferences will see PDC working with each host institution to use the unique resources each zoo has to offer, and to arrange instructors for established workshops. This takes some of the burden off of the host institution, as they will no longer have to be solely in charge of conference programming. It also helps with standardization to have one central group keeping track of workshop offerings, to make sure that all required courses are being offered in a timely manner.

PDC and National AAZK are always grateful for feedback from keepers. The whole point of these changes is to better serve our members. We'd love to hear from Chapters or individuals about your ideas, wants, needs, and critiques. Is there a workshop you'd especially like to attend? Do you have expertise that you think would be valuable to other institutions? Please let us know!

2012 AAZK Conference Workshops

- Team Building
- Professional Development at your Zoo
- African Wild Dog Husbandry
- Emergency Preparedness Workshop
- Basics of AZA Population Management
- Creating a Successful AAZK Chapter
- Raptor Workshop
- Quarantine Protocols
- Management and Prevention of Zoonotic Disease
- Anesthesia and a Zoo Keeper's Role
- A Practical Look at Darting
- Elephant Husbandry and Training
- Ungulate Restraint
- Penguin Husbandry and Restraint
- Small Mammal and Primate Capture and Restraint
- Sloth Husbandry and Training
- Creating a Zoo Keeper Driven Public Relations Program
- Bowling for Rhinos
- Bringing it Home, Local Conservation
- Acres for the Atmosphere
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Conservation and Research for the Western Pond Turtle, (*Clemmys marmorata*), in Northern California

Jessie Bushell, Assistant Curator of ARC and Children's Zoo, San Francisco Zoo, CA
Dr. Nick Geist, Professor of Biology, Sonoma State University, CA

Four years ago a unique opportunity arose to create a local conservation partnership between the two Bay Area zoos, San Francisco Zoo and Oakland Zoo, and a local university working with a declining species of native turtle. Both zoos jumped at the opportunity to form a partnership which has created closer ties between our institutions and provided us with an opportunity to build the base of an important research and conservation effort that we hope will grow in the future.

Before settlers discovered the bounty that California offered, the western pond turtle, (*Clemmys (Emys) marmorata*), dominated freshwater systems throughout the west coast. Marshes, wetland sloughs, lakes and ponds were home to millions of pond turtles and served as an important food source for some American Indian communities. With the quickly growing population of pioneers and the eventual growth of cities, an industry boomed in California harvesting the pond turtle for dinner plates across the state. The climax of harvest was in the late 1800s when tens of thousands of turtles were harvested for commercial use (Bettelheim, 2005). Eventually water resource needs, including a burgeoning agricultural industry, led to the draining of essential turtle habitats. The most well-known was the draining of Tulare Lake in central California (Bettelheim, 2005). Today, the western pond turtle faces numerous challenges, some triggered over a century ago and some new. California's desperate need for water for its growing population and agricultural industry is a major cause in the decline of this species throughout its range (Holland, 1991; Holland, 1994; Spinks *et al.*, 2003). However, other threats may be as hazardous. Urbanization is creating a fragmented population and limits the turtle's use of existing aquatic habitat. The introduction of bullfrogs and largemouth bass increased substantially in the state, and are known to particularly predate on hatchling turtles (Holland, 1991; Moyle, 1973). The release of pet turtles, especially red-eared sliders, may be



At hatching western pond turtles weigh from 2-5 grams. *Photo by A. Frankel*

outcompeting the more mild tempered and smaller native species and bring with them a host of potential pathogens. And of course, the potential impact of global climate change is a looming and unknown threat that we are still learning about.

That brings us back to summer 2008. Dr. Nick Geist, a paleobiologist and professor of Biology at Sonoma State University, was interested in the western pond turtle. His interest was in learning more about the evolution of reproductive behavior in reptiles. Found in the ponds throughout the Sonoma campus was the western pond turtle, the only native freshwater aquatic turtle in California. The turtle piqued Geist's interest and when literature searches into its reproductive biology led to nearly zero information, he was hooked. Turtle gender for most species is determined by the temperature of incubation in the nest but little research had been done on what the critical temperature was for sex determination in this species. Geist devised a research project, got permits from California Department of Fish and Game (CDFG), and then contacted San Francisco and Oakland Zoos. He wanted partners to expand the project from a terminal research study into a larger conservation project. He hoped to facilitate greater understanding of the biology of the pond turtle and to find a way to increase the population of this species listed by the state as a "Species of Special Concern".

Thanks to funding by the AZA Conservation Endowment Fund and Disney's Wildlife Conservation Fund, the first year of the project was extremely successful. A northern California site was selected in Lake County which was co-managed by the Nature Conservancy and the CDFG. Using a combination of tree blinds, radiotelemetry, and plot censusing, gravid female turtles were captured on their first nesting foray. Geist's graduate students and zoo staff researchers collected morphometric data (mass, carapace & plastron length, width, height), pit-tagged, and notched turtles in order to create a method of identification and tracking for recapture in subsequent years. They were also fitted with a radio transmitter and then released back into the pond. Within two to three days, the females would resume nesting behavior and were followed via the transmitter. The female was allowed to nest and then recaptured post-nesting for removal of the transmitter. The exact location of the nest was identified and marked and all eggs were collected and carefully transported back to Geist's lab in Sonoma. The eggs were artificially incubated in the lab at six temperatures ranging from 26°C to 31°C in 5:1 ratio of vermiculite to water. Clutches were divided and eggs were incubated at different temperatures. A previous study (Ewert *et al.*, 1994) had theorized that females hatch at 30+°C, and males under that threshold, but that single study was based on a very small sample of western pond turtle eggs. After hatching, morphometric data was collected and turtles transported to one of the two zoos where they were cared for until release. Headstarting of turtles is not a new idea and Woodland Park Zoo and Oregon Zoo generously shared their western pond turtle headstart protocols for this project. Throughout their headstarting months, the turtles were weighed and measured weekly to provide important growth data and at eight months the juvenile turtles were endoscoped by zoo veterinarians to determine gender. As soon as the waters warmed at the Lake County field site, the young turtles, who were now the size of two or three year-old wild turtles, were released at the site where they were collected as eggs.

The most significant finding of the initial research was the determination of the critical temperature of sex determination. Utilizing two years' data, the critical temperature for a 1:1 Male/Female sex ratio is 29.4°C (Figure 1). Geist also found that there was a very narrow range above that before a lethal threshold was reached that killed the embryos. Our data shows that there are significant effects of clutch and incubation temperature on incubation duration, hatching success and post-hatch growth. Temperature of incubation seemed to significantly effect length of incubation with middle temperatures having the shortest duration of incubation (28°C was lowest with 84 days) (Figure 2). Maximum success of incubation was related to incubation temperature also with the highest success of 93% hatching at 29°C (Figure 3). However, after hatching, clutch effects appear to be significant. Without regard to incubation temperature, hatchlings grew at rates aligned with their nest clutch (2-Way ANOVA: $F_{6,6} = 2.63, P = 0.036$); whereas, there was no significance when analyzed by incubation temperature (2-Way ANOVA: $F_{4,4} = 0.50, P = 0.735$) (Figure 4). Additionally, interesting

field behavior was discovered. At the Lake County site females always began nesting behavior in the first week of June, typically left the water in late afternoon, nested on the northeast side of the lake frequently within 2-300 meters from the pond, and preferred exposed grassy areas with well-drained soil. There were also significant indications of nest site-fidelity within and between years.

In the second year of the project iButton® sensors were placed in nests left to incubate naturally and fitted with wire exclosures to thwart potential predators. Predation of nests by metapredators at the site was a significant cause of hatchling mortality (Holland, 1994). In the studied nests, Geist found massive temperature fluctuations that would appear to heat the nests well above the lethal threshold on a daily basis (Figure 5). Variation was found to exceed 20°C! In addition, there were different thermal profiles within each individual nest. Since nests are dug in a pear-like shape and eggs deposited often in two layers, eggs at different levels experience different thermal extremes and means. Will this ability to tolerate extreme daytime fluctuations with a cooling night be significant in the pond turtle's survival in a warming planet? Will the warming temperatures shift the sex ratio to favor females who develop at higher temperatures? These questions are what have led to the current research.

Data is being collected to explore two major areas of study – which landscape conditions characterize optimal nesting habitat and how temperature effects hatching success, growth, and sex determination for *in situ* nests of western pond turtles. Because this aquatic species nests in relatively dry, upland areas, often at considerable distance from the water, the ability to identify, predict, and manage suitable nesting habitats using features such as percent canopy cover, foliage type, cardinal direction from waterway, etc., is critical to effective field-based conservation strategies of the future. Through this research we hope to provide distinct criteria for the physical conditions that constitute preferred nesting habitat. First, what are the optimal microhabitat conditions for nesting success of this species? Since the western pond turtle is a species with temperature-dependent sex determination (TSD), temperature profiles within nest chambers are being measured. Nest temperature is especially critical

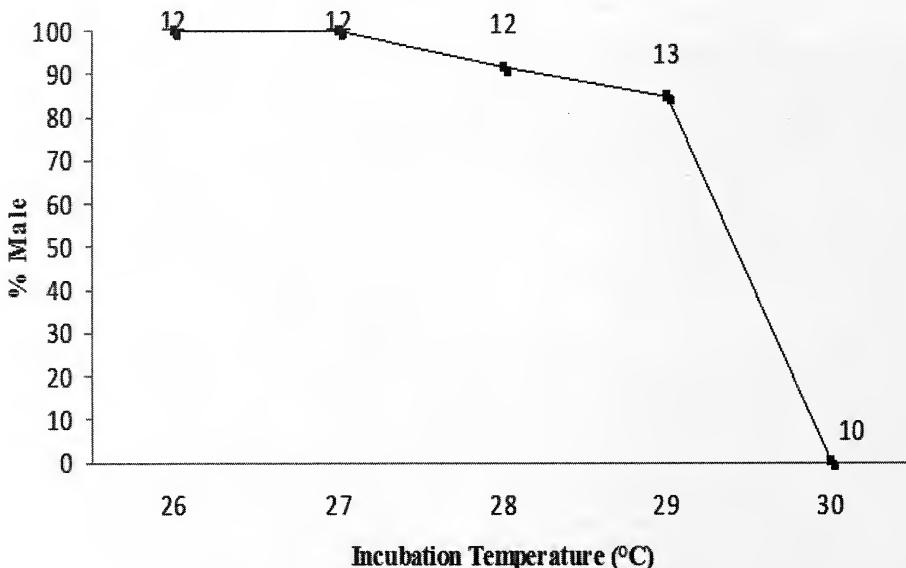


Figure 1. Temperature-Dependent Sex Determination results from endoscopic identification of gonads at ~9 months, >20 gr mass. Pivotal temperature for 1:1 M/F ratio is 29.4°C. (Geist, Dallara, Gordon, Horne, and Mutlow, in prep)

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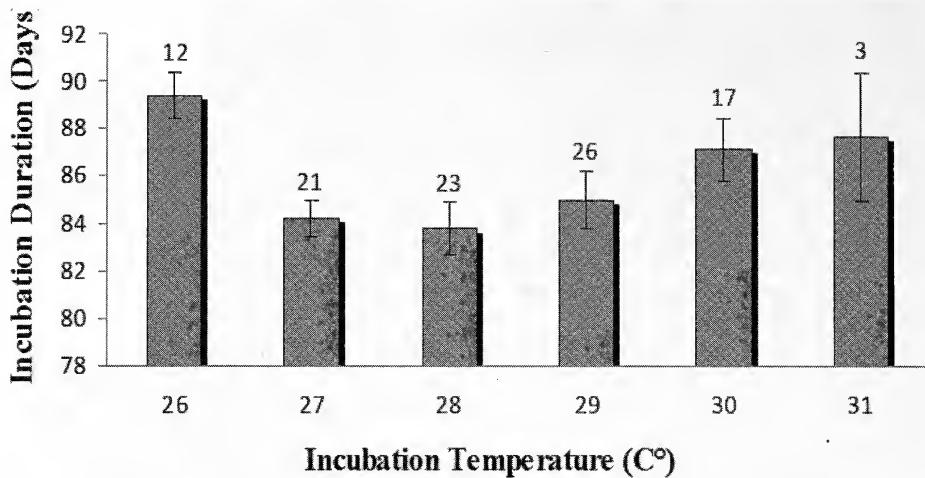


Figure 2. Temperature Effects on Incubation Duration (1-Way ANOVA: $F_{5,96}=2.63$, $P = 0.028$) (Geist, Dallara and Gordon, in review)

to reproductive success and juvenile fitness but little data on nest environment exist for this species. Secondly, we hope to determine if western pond turtles practice nest philopatry/nest site fidelity. Many turtle species are known to be very discriminating in choice of nest sites and return faithfully to the same nest sites year after year, but little data on this behavior is available for western pond turtles. So far, our four-year study has identified and mapped over 100 turtle nests at the field site and preliminary analysis of nest sites indicates that a percentage of nesting females show philopatric behavior. Each year we get a higher percentage of females marked in previous years returning to

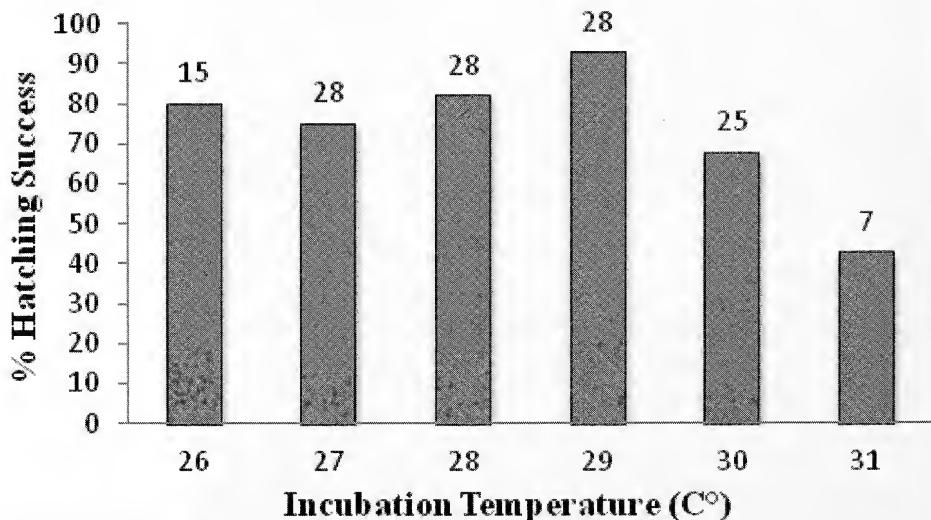


Figure 3. Temperature Effects on Hatching Success (G-Test: $G_2=16.12$, $df = 5$, $p = .007$) (Geist, Dallara, and Gordon, in review)

nest, so we continuously add to this database by recording GPS data from each new nest. These data should allow us to identify and characterize a pattern of philopatry. And finally, understanding the role of the thermal environment on embryonic development and phenotype is especially important in reptilian species with TSD. We are continuing to study how incubation temperature and temperature fluctuation effects hatching success, juvenile growth and fitness, and hatchling sex ratios.

All of the institutions and individuals involved in this collaborative project have benefitted beyond our expectations. Our veterinary staff has developed expertise in endoscopic procedures on turtles as small as 20 grams or just over the size of a quarter. Volunteers and docents have become adept at discussing native, local conservation initiatives. Zoo staff have developed skills and husbandry techniques to improve the care of neonate chelonians. And several graduate students have successfully completed Master's theses and submitted papers to journals which will add to the growing knowledge of this fascinating turtle. But most important of all, there is renewed interest in this Species of Special Concern, more people are aware of its decreasing numbers, and more pressure is being put on agencies to monitor populations closely so we don't lose the small foothold that the western pond turtle has left in California.

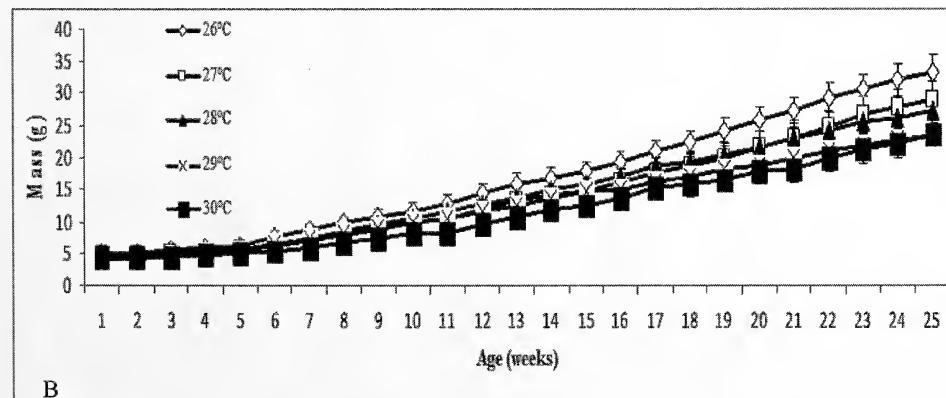
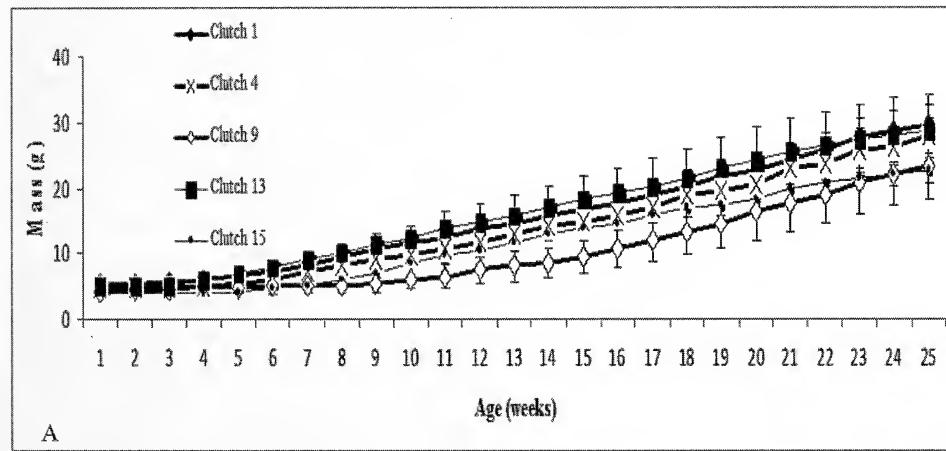


Figure 4A. Clutch Effects on Hatchling Growth (2-Way ANOVA: $F_{6,6} = 2.63$, $P = 0.036$)
 Figure 4B. Incubation Temperature Effects on Hatchling Growth (2-Way ANOVA: $F_{4,4} = 0.50$, $P = 0.735$)

References

Bettleheim, M. P. 2005. Marmorata: The Famed Mud Turtle of the San Francisco Market. *California History* 82(4): 90-106

Ewert, M.A., D.R. Jackson and C.E. Nelson. 1994. Patterns of Temperature-Dependent Sex Determination in Turtles. *Journal of Experimental Zoology* 270:3-15.

Holland, D. C. 1991. A synopsis of the ecology and status of the western pond turtle (*Clemmys marmorata*) in 1991. Report to National Ecology Research Center, US Fish and Wildlife Service, San Simeon, CA.

Holland, D.C. 1994. The Western Pond Turtle: Habitat and History. Report to U.S. Department of Energy

Bonneville Power Administration Environment, Fish and Wildlife. Portland, OR.

Moyle, P. B. 1973. Effect of introduced bullfrogs (*Rana catesbeiana*) on the native frogs of the San Joaquin Valley, California. *Copeia* 1973:18-22.

Spinks, P. Q., Pauly, G. P. Crayon, J. J., and Shaffer, H.B. 2003. Survival of the western pond turtle (*Emys marmorata*) in an urban California environment. *Biological Conservation*. 113: 257-267



Pond turtles dig nests in the soil using their urine to soften the ground. *Photo by Z. Dallara*



Juvenile turtles are released at approximately ten months of age and are about the size of a three year-old wild turtle. *Photo by J. Bushell*

Turtles in Trouble

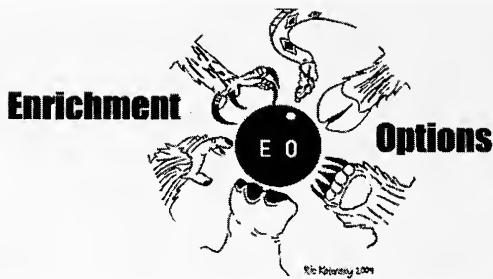
by Greg McKinney, *Conservation/Legislative Update*

The Wildlife Conservation Society on 11 April 2012 announced that it will work to prevent the extinction of at least a dozen of the world's most endangered turtles and tortoises through the development of off-exhibit assurance colonies and reintroductions. In a report presented in February 2011 by the Turtle Conservation Coalition, WCS and others, the world's most endangered tortoises and fresh-water turtles were identified. The report states that "turtles are much more at risk of impending extinction than birds, mammals, and amphibians" and warns that "without concerted conservation action, many of the world's turtles and tortoises will become extinct within the next few decades."

Threats to turtles include habitat destruction and illegal trade. The trade is mainly driven by demand from China where turtles are used in traditional medicine as well as for human consumption. Of the top 25 most endangered turtles, 17 are found in Asia. WCS is committed to working with governments worldwide to combat these threats.

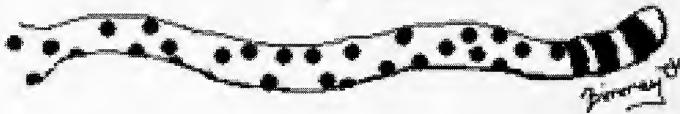
The 2011 report, *Turtles in Trouble* can be found at WCS.org through their resources link.

Source: Wildlife Conservation Society



The AAZK Behavioral Husbandry Committee Column

Training Tales...



Advances in Waterfowl Training and Enrichment at Disney's Animal Kingdom®

By

Stacy Johnson, Animal Keeper
Disney's Animal Kingdom®, Lake Buena Vista, Florida

Abstract

“Waterfowl” is a collective term given to the order *Anseriformes*, consisting mostly of ducks, geese and swans. There are currently over 150 species represented on every continent except Antarctica. Most ducks fall in to the categories of dabblers, divers and perchers.

Several species of ducks and swans are represented within the Oasis area of Disney's Animal Kingdom®. The largest pond houses red shoveler (*Anas platyrhynchos*), red-crested pochards (*Netta rufina*), common white-eye (*Aythya nyroca*), rosybill (*Netta peposaca*), yellow-billed duck (*Anas undulata*), black-necked swans (*Cygnus melanocoryphus*), tufted ducks (*Aythya fuligula*) and plumed whistling duck (*Dendrocygna eytoni*). Despite the size of this large pond, keepers need to get within close proximity to the ducks to conduct health checks and administer medications when needed. The pond is also an open exhibit, allowing native wildlife (e.g., white ibis and mallard ducks) easy access causing competition for food. To meet these challenges, we implemented four training behaviors: “come”, hand feeding, scale and chute. To further enhance waterfowl management, the waterfowl enrichment program was also expanded to include sinking feeders, floating feeders and variations of food presentation. The investment in waterfowl training and enrichment has also allowed us to obtain weights, reduce capture stress, and engage visitors in our daily husbandry.

Training

All of the waterfowl in the current collection are captive bred, but like most species, they remained elusive to keepers upon our arrival. Therefore, our initial training goal was to desensitize all 22 individuals to the close proximity of keepers. This would help with better management of daily feedings, as well as facilitate physical and behavioral observations. We began the process by pairing the sound of a clicker (in rapid succession) with food. Birds were cued to come to where the keeper was standing in a designated shallow part of the pond. Initially, any movement in the keeper's direction was reinforced. As the criterion was tightened, closer proximity to the keeper was reinforced and we were able to get close enough to do quick visual assessments of individual ducks. All of the birds quickly learned that the sound of the cue signaled the availability of food and, within a matter of weeks, all ducks were responding to the come cue (the clicker). We hoped that, over time, the birds would be comfortable enough around us to remain in the immediate area for longer periods while eating. Within a few weeks, "Calum" (red crested pochard), "Mallomar" (black-necked swan), "Mr. Snoops" (yellow-billed duck), "Bianca" (rosy-billed pochard), "Tank" and "Titan" (tufted ducks) and "Siren" (red shoveler) all remained in the vicinity of the keeper to eat during the entire feed session. Little did we know that some would become so comfortable with us, they would start pecking at our boots if we did not get food to them fast enough!

The birds' high level of food motivation prompted us to move on to our next goal of hand feeding. Once the ducks were cued to the designated feeding area, the keeper used favorite food items (e.g., Romaine lettuce, krill, finch seed, millet, crickets) to entice birds to approach and take the item from the keeper's hand. The waterfowl in the collection were fed three times per day. Hand feeding was attempted at each feed. Not surprisingly, many of the ducks either swam away or remained just out of reach. After a few weeks, the most gregarious waterfowl (yellow-billed ducks, black-necked swans, and a rosybill) began to feed from a keeper's hand. In another two weeks most of the waterfowl in the pond came close enough to quickly grab a bite from the keepers and swim away. After working on this for another month, most of the waterfowl began to establish preferred feeding locations



Figure 1. Scale and chute training session set-up location

near the keeper. However, there were still some extremely shy waterfowl species in the collection, like the common white-eyes, that never attempted to hand feed. An added benefit to this training was that some individuals began to defend their “feed area” from native birds, facilitating the hand feeding sessions. The success of hand feeding enabled us to more closely monitor individual food consumption and allowed medication to be administered to specific individuals.

With the group well acclimated to the proximity of keepers and hand feeding, our next goal was to start scale and chute training. We wanted to get monthly weights on all of the ducks to ensure they weren’t being out-competed by native waterfowl in the area. In addition, we wanted to introduce an exclusionary device: a chute that could minimize the intrusion of native birds in the feed area. The chute is a very simple design made of box wire (L 96cm x W 43cm x H 42cm) with one hinged side.



Figure 2. Baiting ducks to the scale and allowing them to eat food items from it

The chute allowed collection animals to swim in, get their food, and swim back out. If a native bird tried to get in, the side could be closed, excluding them from the area.

An initial challenge to implementing both scale and chute training was finding a suitable location in the exhibit where both the scale and chute could be introduced. The original feed area was not ideal due to limited space. Once we found a level area near the shoreline for the scale with enough water area for the chute, we introduced another sound cue, a castanet, as the training cue for the start of the sessions.

Scale and chute training began with two keepers on the bank, near the shoreline with the small scale (L 32cm x W 28cm x H 3.8cm) and chute (Figure 1). These training sessions were conducted at least once per week. The castanet cue was paired with crickets being tossed into the water. In the first week, none



Figure 3. Yellow-billed duck "Mr. Snoops" hand feeding from trainer while stationing on the scale

of the waterfowl came closer than five feet from the bank. We reinforced any orientation to the new designated area. It didn't take long for several of the ducks to begin participating in sessions.

Most of the ducks were easily baited to the scale (Fig. 2). Acclimation to the chute worked much the same way, using crickets as reinforcement for any movement toward the chute opening. The swans preferred romaine lettuce to all other items, so this was used for them. Progress to the completed behavior of stepping on the scale and entering the chute was slow. After a period of five months (with 1 to 2 sessions per week), we were able to get voluntary weights on 10 of the 22 birds (including the swans) (Fig. 3-4). All of the

collection birds in this enclosure would then eat off of the scale, and many more put at least a foot on the scale. Also, all birds (excluding the swans due to their size) entered the chute and ate within it on the shoreline or hand fed within the chute (Fig. 5-6). Since the chute added some distance between keepers and the ducks, it allowed more elusive species, like the common white-eyes, to participate in sessions.

Enrichment

Taking into account the animals' natural and individual history, we set our goals to encourage diving,



Figure 7. Floating grass flat feeder anchored with a brick

dabbling, foraging, vocalizing, and swimming. The waterfowl received enrichment daily, which was rotated throughout the month. From daily observations, the most successful enrichment items were: a sinking lettuce feeder, floating grass flat feeder (Fig. 7), millet, finch seed, cucumber, lettuce, a sinking log lettuce feeder, krill, and sinking ice blocks (Fig. 8) made with enrichment food items. Enrichment was presented in a way that allowed some items to sink, encouraging diving in the deep end of the pond and dabbling in the shallows. A few of the floating feeders also provided perching areas. These enrichment items also provided social interactions, as all of the collection came over to investigate and interact with the enrichment, each other and keepers.

Outcomes and Future Goals

The waterfowl training program at Disney's Animal Kingdom® has grown a great deal in the last few years. The ducks keep surprising us with their adaptability and motivation. While initially wary and reluctant to be in close proximity with keepers, the majority of individual birds now quickly respond to the keepers' approach, waiting at the shoreline before we even enter the exhibit. We feel training sessions have become enriching for the group. There seems to be an increase in activity and vocalizations just prior to the start of each session. We have also observed the dominance hierarchy of the collection, with certain individuals actually defending the scale and chute from the other birds. We never anticipated having to acquire more chutes and scales to curb this territoriality - a new sign of training success! We have also brought in scale-like platforms (Fig.9) as stationing areas for those ducks that remain on the scale, allowing us to work with other ducks.

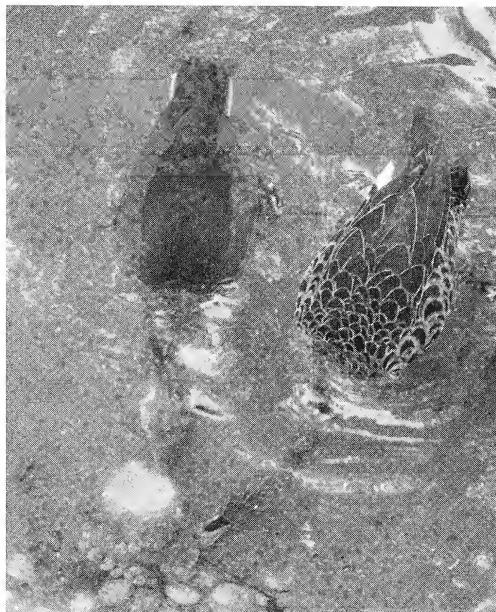


Figure 8. Sinking ice block (millet and lettuce) encouraging dabbling

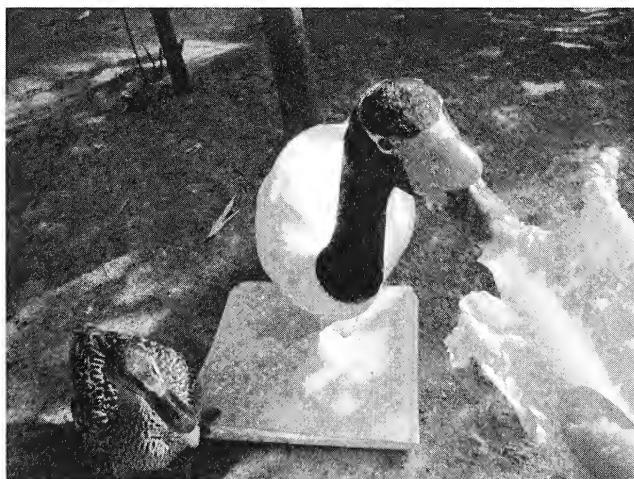


Figure 9. Hand feeding the black-necked swan "Mallomar" on a dummy scale platform

A future goal is to initiate tactile stimulation with some of the birds. For example, desensitizing the fully-flighted black-necked swans to allow tactile stimulation would facilitate routine wing checks. We would eventually like to see this progress to voluntary wing trims. We also hope to work on crate training with the entire collection to increase our husbandry management and decrease stress to the birds through catch-ups.

Training the waterfowl and enriching their environment in view of park visitors has enhanced our interactions with them. Keepers are able to share

a lot of the natural and individual history of our collection. Some visitors learn for the first time about “dabblers and divers” by watching us implement different enrichment. It also gives us an opportunity to talk about what we do on a daily basis. Visitors learn first-hand about the dedication and patience involved with day to day husbandry and zoo keeping. Finally, this interaction with the public allows us to share our passion for waterfowl, in the hopes that visitors come away with a new appreciation of this diverse, intelligent and fun group of birds!

Discussion

We have learned a lot about the waterfowl in our collection, as individuals and as a group. The expanded training and enrichment program seems to encourage more activity in and investigation of their environment. It has also facilitated our ability to meet daily husbandry needs. Although training waterfowl and enriching their environment may take time and effort, the results can be rewarding. Keepers can now interact with the ducks more than ever, with a new sense of understanding and appreciation. The birds seem eager to continue training, which presents us with the exciting challenge of developing new training and enrichment initiatives for the future.

Acknowledgements

I would like to thank Stephanie Smith for her active participation in the training and enrichment program, Dan Calvin for filling in training gaps, the Duck Clutch crew for their helpful ideas, Heather Dunford for starting the chute process, and the Oasis team and managers for all their support and patience through this project.

Note: All images are from Disney’s Animal Kingdom®. This paper was previously presented at IAATE Conference, Feb. 18, 2012. Publication data is:

Johnson S. 2012. Advances in Waterfowl Training and Enrichment at Disney’s Animal Kingdom. In *Proceedings of the 20th Annual Conference of the International Association of Avian Trainers and Educators (IAATE)*. February 15-18, 2012 in Bloomington, MN.

BHC Comments by Julie Hartell and Kim Kezer, Column Editors:

Thanks Stacy for such a great in-depth article on the behavioral husbandry possibilities of a taxonomic group that doesn’t always get the training and enrichment attention they deserve! We really appreciated how you used the different natural history feeding strategies of this group (divers & dabblers) to develop diverse feeding opportunities for all of the individuals in the group. It is also great to hear how the feeding enrichment initiatives provided more than just dietary and consumptive behavior opportunities; that they facilitated social behaviors and provided varying perching opportunities.

Training opens up so many unexpected experiences and surprises when you begin to condition a taxa not usually high on the priority list of animals to train. Recognizing their motivation and ability to adapt to new criteria demonstrates how the approach your team used helped to facilitate the program’s success. You have established a strong foundation for your training which will help you to achieve your long-term goals of crate training, wing checks and trims. Good luck and be sure to share those successes with us as well!

Lastly, it is fantastic to hear how this amazing training and enrichment program has created opportunities for you to engage with guests and teach them about these wonderful waterfowl species while also sharing with them the dedication and passion we zoo keepers have for providing the utmost in comprehensive animal care. Thanks for your submission!

Determining Pregnancy in the Giant Anteater (*Myrmecophaga tridactyla*): A Case Study at the Smithsonian's National Zoological Park

By Leigh Pitsko and Marie Magnuson, Animal Keepers
Smithsonian's National Zoological Park, Washington, DC



Giant anteater pup, National Zoological Park. Photo by Mehgan Murphy

Introduction

The giant anteater (*Myrmecophaga tridactyla*) does not show any obvious physical or behavioral indicators of pregnancy (DeBeauchamp et al., 2005; Patzl et al., 1998; Kusuda et al., 2010). In reports from zoos around the world, it is not uncommon to hear about “surprise” giant anteater births, where keepers were unaware that the animal was pregnant. An unexpected birth may yield neonate deaths, as the male is recommended to be separated from the female prior to the birth to prevent potential injury to the pup (Patzl et al., 1998). Also, preparations need to be made in advance as the pup may require supplemental feeding or special veterinary care if there are any post-birth complications.

I was interested in collecting data during our giant anteater’s pregnancy to determine if there were any behavioral or physical signs of her pregnancy that could be observed by a keeper during normal husbandry practices. This information could be useful to keepers who are unable to handle or ultrasound their giant anteaters and could be beneficial in preventing unexpected births.

Methods

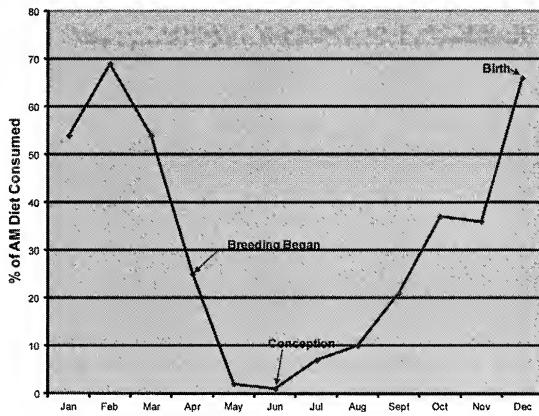
The following information (food consumption, activity level, and spotting) was collected daily, beginning when our giant anteaters were introduced for breeding in April 2010, through the birth of their pup in December 2010. The rust-colored spotting is what we believe to be a vaginal secretion that we find in the female anteater's sleeping crate. Weight was also recorded on a weekly basis. These categories were chosen as they are readily observable by keepers on a daily basis, do not require handling the animal, and they require no special equipment other than a scale. This anteater's pregnancy was also confirmed via weekly ultrasound as routine practice with this particular animal.

Results

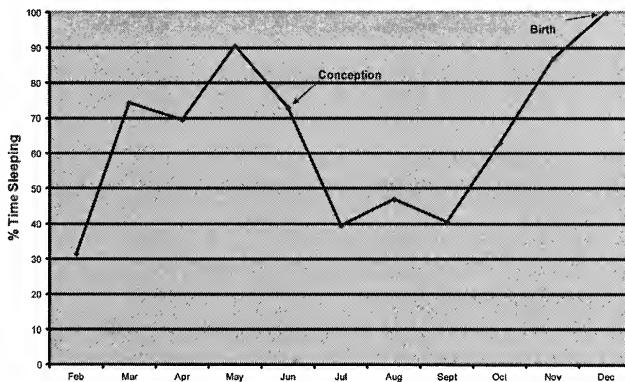
Graph 1: Giant Anteater - Morning Food Consumption

Food Consumption: This giant anteater (Maripi) is fed a gruel made of ground Mazuri® insectivore chow mixed with water twice a day. Her morning food consumption decreased during the months where breeding was seen and then it increased steadily throughout her pregnancy (Graph 1). At the start of breeding in April she was consuming approximately 25% of her morning diet, which went down to nearly 0% in June when the breeding ended. By the time of birth in December she was eating about 55% of her morning diet. Her evening food consumption did not show any significant changes and remained steady at about 85% throughout the entire period of data collection.

Activity Level: For the first three months after breeding, Maripi was more active in the morning and was relatively easy to move for shifting. Approximately two months before the birth, she spent increasingly more time sleeping in the morning and was difficult to wake up for shifting (Graph 2). Her evening activity level did not change as she was always up and moving around in the late afternoon.



Graph 2: Giant Anteater - % Time Sleeping in AM During Pregnancy



Weight: Maripi's weight increased steadily following the final breeding date through the time of birth. She weighed about 37.0 kg at the time of conception and went up to 45.0 kg at the time of birth (Graph 3).

Spotting: Observable spotting in giant anteaters has been described in previous studies (DeBeauchamp et al., 2005) as well as in the Southern tamandua (*Tamandua tetradactyla*), which is reported as vulvar bleeding (Kusuda et al., 2010). Almost all breeding occurred within a few days of when we saw the spotting in her crate (Table 1). After the final breeding date, Maripi's spotting essentially stopped for about 3.5 months. Approximately two months before the birth, Maripi's spotting was noted almost daily.

Graph 3: Giant Anteater - Monthly Weights During Pregnancy

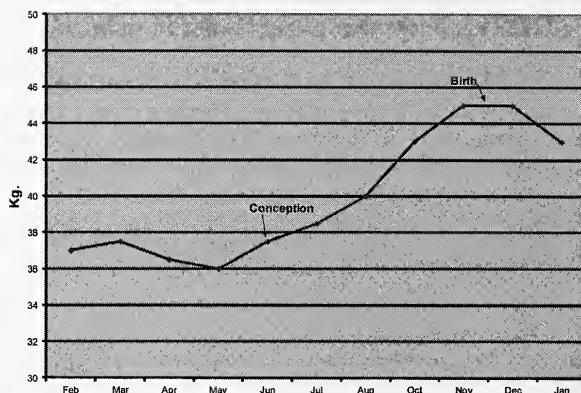


Table 1. Spotting and breeding in 0.1 giant anteater (*Myrmecophaga tridactyla*)

	April	May	June
Spotting Dates	8, 9, 10, 24	30	10,13
Breeding Dates	9	2,29	12

We also noted that a week before the birth, the spotting changed in color (rusty color became bright red) and there was noticeably more of it in the crate. Maripi's vulva also got much larger and swollen about a week before the birth, which was also noted in keeper reports from her previous pregnancies. Checking her vulva required lifting up her tail, which may not work for animals that do not allow handling, but it is possibly the biggest indicator of impending birth that we observed.

Conclusions

Results of this case study reveal that in this particular giant anteater, it may be possible to determine pregnancy based on the following changes in behavior, weight and observable spotting:

- A gradual increase in morning food consumption following the breeding period
- An increase in sleeping in the morning with difficulty of waking her up approximately two months before the birth
- A gradual, steady weight gain of 8kg [17.64lbs.] in six months
- An almost complete lack of observable spotting for three and a half months, followed by two months of frequent light spotting
- Heavier spotting a week before birth, along with a visibly enlarged vulva
- This anteater's gestation period was 178 days, which supports other findings (DeBeauchamp et al., 2005; Patzl et al., 1998). Further data collection is in progress to look at the spotting/breeding correlation in this animal.



Giant anteater pup, National Zoological Park. *Photo by Mehgan Murphy*

Acknowledgements

Thanks to Kristen Clark, Rebecca Stites, Karen Abbott, and Tracey Barnes for filling out data sheets and to Craig Saffoe for support and guidance.

References

DeBeauchamp, J., Hudgins, J., DeCaluwe, H., Kouba, A., Riger, P., and C. Vance. 2005. Monitoring reproductive status in the female giant anteater (*Myrmecophaga tridactyla*) by fecal hormone analysis for improved breeding management. *J Tennessee Academy of Science*. July.

Hay, M.A., Bellem, A.C., Brown, J.L., and K.L. Goodrowe. 1994. Reproductive patterns in tamandua (*Tamandua tetradactyla*). *J Zoo Wildl Med* 25:248-258.

Kusuda, S., Endoh, T., Tanaka, H., Adachi, I., Doi, O., and J. Kimura. 2010. Relationship between gonadal steroid hormones and vulval bleeding in Southern tamandua, *Tamandua tetradactyla*. *Zoo Biology* 29:1-6.

Patzl, M., Schwarzenberger, F., Osmann, C., Bamberg, E., and W. Bartman. 1998. Monitoring ovarian cycle and pregnancy in the giant anteater (*Myrmecophaga tridactyla*) by faecal progestagen and oestrogen analysis. *Anim Reprod Sci* 53:209-219.

Design and Construction of Scale Holder and Weighing Platform for Hard-to-Weigh Spider Monkeys

By Melinda Beam, Primate Keeper III
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Providing excellent animal husbandry requires getting regular, accurate weights on the animals under our care. Low weight can signal, among other things, low calorie consumption, high stress, parasites, or digestive problems. High weight can signal high calorie consumption, lack of physical stimulation, fluctuations in hormone levels, or pregnancy. If a change in weight is not noticed until it is severe, it may be too late to address the issue. Some animals, such as spider monkeys (*Ateles geoffroyi*), can be difficult to weigh due to the potential for damage to the scale as well as potential fear of the scale. With the high cost of scales and the stretched resources of many captive animal institutions, trial and error is not necessarily the best option. With four spider monkeys in my care, I needed to be creative and adapt our current methods of weighing to overcome their unique problems. I developed two separate devices, a weighing platform and a scale holder, that have been effective in getting weights on each of them as well as other difficult-to-weigh primates.

At the time I began to test successful strategies for weighing them, we had five male spider monkeys being housed in off-exhibit enclosures, four black-handed spider monkeys (*Ateles geoffroyi geoffroyi*) and one Mexican spider monkey (*Ateles geoffroyi vellerosus*). Each was singly housed in close proximity to the others, and each was at a different stage with their scale training. Only one monkey, Mercury, was willing to sit on the scale, but even he, if excited or upset, would pick up and drop the scale, risking breaking it. The other four monkeys, Poquito, Himie, Brock, and Oren, were not anywhere close to sitting on the scale, and weights on them were obtained only when they were sedated for an exam. Based on observations with enrichment and during training sessions, I determined the likely challenges for each monkey individually. I identified the two most challenging cases and aimed to find a solution for them first, with the hope that the methods used could also be applied to get weights on the other two.

Case 1: Poquito, the Mexican spider monkey, refused to train on the floor. He would sit on the ground when no one was close but would not sit down across from a keeper for any reason. He would, however, train with a keeper on an elevated platform. He was frequently aggressive with enrichment when first presented with it, so he was likely to be aggressive with the scale as well. I needed to come up with a secure device to hold the scale and weigh him in an elevated location.

Case 2: Brock consistently trained on the floor but was always very aggressive when shifted over to

his newly cleaned and enriched bedrooms, throwing everything around a time or two to see what busted open before he sat down to forage through the remnants. He would likely break the scale, so I needed to develop a method to fully secure the scale on the floor.

Case 3 (less challenging): Himie consistently trained on the floor and was not aggressive with enrichment, but showed intense fear of the scale. He had been presented with the scale during multiple training sessions and was very scared by it, keeping far away from it and making fearful vocalizations. I needed to come up with a way to make the scale less frightening.

Case 4 (less challenging): Oren consistently trained on the floor and was not typically aggressive with enrichment but showed strong avoidance of the scale, hopping over and around it before completely disengaging himself from the training session altogether. I needed to develop a way to make the scale appear less intimidating and foreign.

After some brainstorming, I designed a scale holder for Brock (Figure 1). To increase the likelihood of success, I needed the scale to sit securely in the exact location where Brock typically stations for training sessions. Incorporating the dimensions of the scale and the space that would be used for weighing, I was able to determine the dimensions needed for the scale holder. It would be constructed completely of 1.3 cm (1/2") thick black plastic. It would have a full lip around and over the edges of the scale to prevent it from being grabbed or manipulated in any way. Next, I had to make sure the entire holder could not be moved, so I figured out a method for it to come out under the door of the bedroom and down into the gutter, which runs along the outside of all of the bedrooms, and across its entire width. This worked to fully secure the scale holder and to protect the scale itself. The final product can be viewed in Figure 2.

Next, I developed a weighing platform with removable lips for Poquito (Figure 3).

I measured the scale and added an inch to each side for the base of the platform. The base was constructed of two-by-fours and covered in 1.3 cm (1/2") thick black plastic. Eight 5.1 cm (2")

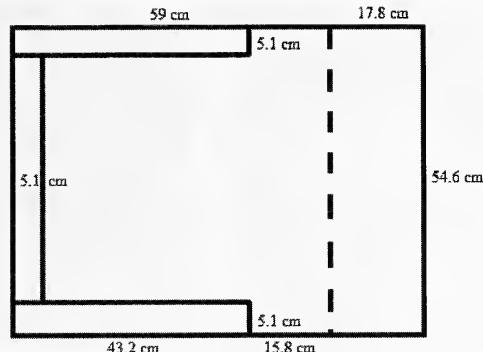


Figure 1a. Top view of scale holder design.

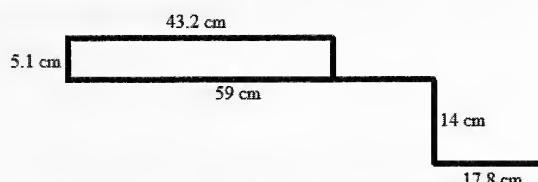


Figure 1b. Side view of scale holder design.

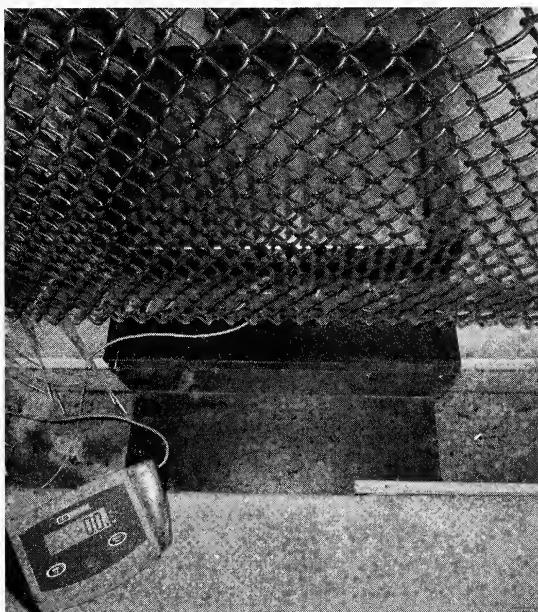


Figure 2. Scale holder with scale set up in one of our off-exhibit holding bedrooms. Photo by Melinda Beam.

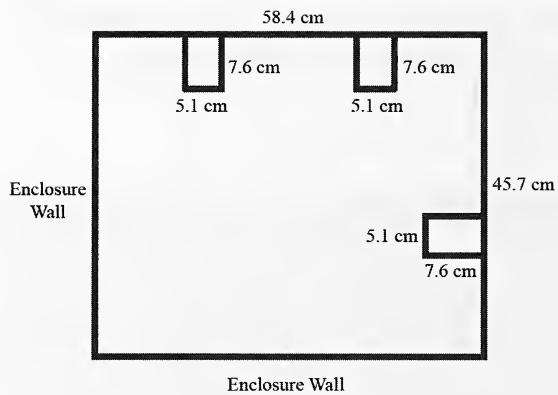


Figure 3a. Top view of the weighing platform design.

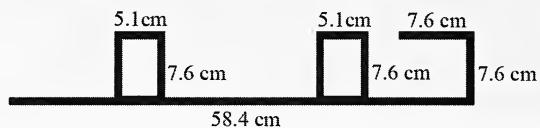


Figure 3b. Side view of the weighing platform design.

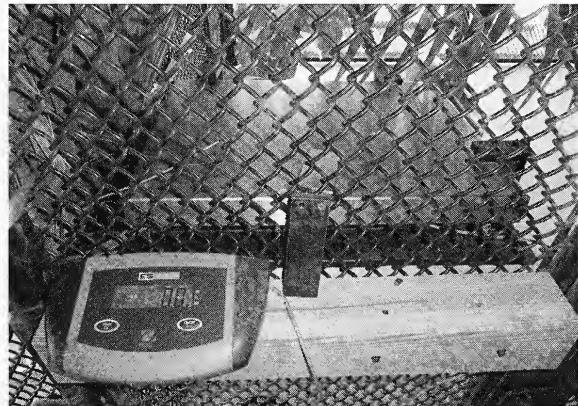


Figure 4. The weighing platform with the scale in it, set up in Poquito's bedroom. *Photo by Melinda Beam.*

damage the scale, his attention was refocused on a training behaviors he consistently presents. He was rewarded heavily when he made advancements in touching the scale. Once he realized there were no negative results from touching or sitting on the scale, he was willing to station on it. Like Brock, he has maintained the same level of comfort with the weighing platform and the scale, allowing us to weigh him at more frequent intervals.

A weighing platform, similar to Poquito's but with slightly different dimensions, was designed to fit Himie's bedroom and was effective in desensitizing him to the scale. He typically trains on the floor, so during the following training session the scale was placed in the scale holder. He had to be desensitized to the scale again since it was on the floor but was comfortable with it again within one training

by 7.6 cm (3") pieces of plastic were cut. Six pieces were drilled together in pairs to form an "L" shape that was then drilled on to the platform to act as a lip to prevent the scale from being lifted or knocked off. The remaining two pieces were drilled together through the mesh wall of the enclosure just before weighing to fully secure the scale. The final product can be viewed in Figure 4.

The scale holder was a success with Brock during the very first training session it was introduced (Figure 5). He attempted to pick it up and flip it with no success. He did not want to station on the scale and avoided it after accepting that he could not move it. He was refocused on a training session that involved only maintenance behaviors he consistently gave on cue. As he got in the training routine, he followed cues that involved touching and eventually sitting on the scale. Soon, he realized there were no negative results from touching or sitting on the scale and he was willing to station on it. Once desensitized to the scale, he has maintained that level of comfort ever since, and we are now able to get frequent weights on him. The scale holder has also been successful for getting weights on Himie and Oren. Himie, however, was first desensitized to the scale when it was on a weighing platform built for him.

The weighing platform was a success for Poquito during its maiden voyage as well (Figure 6). Poquito, like Brock, first showed aggression toward the scale, attempting to pick it up and pull on it. Once he realized he could not

session incorporating only maintenance

behaviors he consistently presents. He was rewarded heavily when he made advancements in touching the scale.

Once he realized there were no negative results from touching or sitting on the scale, he was

willing to station on it. Like Brock, he has maintained the same level of comfort with the weighing

platform and the scale, allowing us to weigh him at more frequent intervals.

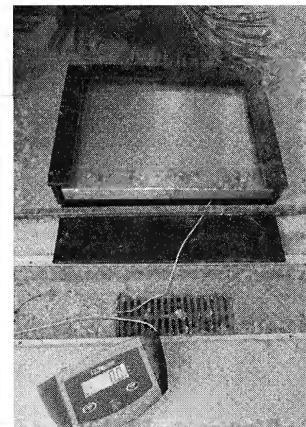


Figure 5 (left) Brock sitting on the scale within the scale holder.

Figure 6 (center) Poquito being weighed using the scale on the weighing platform.

Figure 7 (right) The scale holder and scale with the front attachment removed, positioned in one of Oren's bedrooms with the door left open. *Photos by Melinda Beam.*

session. Oren took two training sessions with the scale holder to get him to station long enough to get an accurate weight, but significant progress was made within the first session. Due to Oren's lack of aggression towards the scale, it was able to be used with the front attachment, the piece which goes down into the gutter to fully secure the scale, removed. (Figures 7 and 8)

These two devices were effective in combating four different problems with weighing monkeys that had seemed too difficult to weigh for a very long time. Weighing them regularly will give us early notice to any fluctuations in weight that could indicate a health concern. Both the scale holder and the weighing platform can be adapted to other physical environments and for other scale sizes to effectively weigh a variety of species. The scale holder has already been successfully adapted and used to weigh an additional spider monkey located at our spider monkey exhibit that we had not been able to weigh due to severe aggression towards the scale. The weighing platform design has been adjusted to our squirrel monkey enclosure to provide a more consistent and sturdy weighing surface.

I'd like to thank Frank Garcia, a member of our maintenance staff, for his assistance in the construction of the scale holder and weighing platforms. Special thanks also to Tamara Loeffler, primate run intern, for her assistance in first implementing the weighing platform and scale holder and Kelly Marcoux, swing keeper, for continued participation in implementation of the weighing platform and scale holder.



Figure 8. Oren being weighed using the scale holder with the front attachment removed. *Photo by Melinda Beam.*

CONSERVATION STATION

Are *Waribashi* worth it? The Threat of Disposable Wooden Chopsticks

By Lauren Augustine and Kenton Kerns, Animal Keepers
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Washington, D.C. 20008



Have you ever considered the conservation threat of disposable chopsticks or *Waribashi* as they are known in Japan? These small wooden utensils are an environmental disaster, and the threat is moving to North American forests. Disposable chopsticks are made largely from old growth forests that are clear-cut in the search for the perfect straight-grained wood. Poplar, spruce, birch, (1,2) and aspen (3,4) are the most commonly used species in disposable chopstick production.

China produces roughly 63 billion chopsticks a year (5) half of which are used in China, and of the other half, 77% goes to Japan, 21% percent to South Korea and 2% to the United States (2). This equates to approximately 3.8 billion trees felled annually in China for disposable chopsticks (2). In 1997, a moratorium in China on domestic tree cutting forced the Chinese to rely heavily on their neighbor, Russia. Timber-rich Russia was the perfect place for the Chinese to acquire lumber until the Russians raised their export tax from 5% to 25% (6). As a result of this tax hike in 2007, disposable chopstick prices are increasing in China.

To combat the massive deforestation in China, a push has been made by conservation groups to utilize reusable or washable chopsticks. In 2006, the “Bring Your Own Chopsticks” movement (BYOC) was developed in parts of Asia (1), helping raise public awareness and eventually galvanizing legislative action. In 2007, China imposed a tax on wooden chopsticks (2,7). In 2008, the Beijing Olympics committee banned disposable chopsticks during the torch relay (5). In 2010, China’s Ministry of Commerce issued a warning about impending government restrictions to disposable chopstick manufacturers (1).

This problem is not confined to Asia; it has historically and is now currently encroaching on the United States and Canada. Chopstick production in the USA and Canada has become more profitable for local and foreign businessmen after a 2006 Chinese export tax caused a noticeable price increase for the Japanese (2). One Georgia company exports two million disposable chopsticks to China every day (6). This small town in Georgia was not the first to capitalize on the global chopstick business. In 1985, a company in New Mexico manufactured and exported disposable chopsticks to Japan (8) and, in 1987, a small town in Minnesota was doing the same (9); several cities in Canada have had similar businesses (4). Many of these initial chopstick factories failed due to inefficient machinery (10). With new machinery from South Korea and recent tax hikes on Chinese chopsticks (11), the United States is in a position to increase its disposable chopstick manufacturing. The company in Georgia is doing so well exploiting its sweet gum and poplar trees it is already considering expanding to other states including Florida, Alabama, Mississippi, Virginia, West Virginia, Michigan, and Oregon (6).

With the deforestation for the production of chopsticks comes the loss of critical animal habitat and sounds a major alarm for already declining worldwide amphibian populations. Nearly one-third (32%) of the approximated world’s 6,300 amphibian species have been classified as threatened with extinction (12). Of these, the collaborators of a new conservation initiative, “Chopsticks for Salamanders” have chosen salamanders as the flagship species for this initiative. Caudates, or salamanders and newts, utilize both terrestrial and aquatic ecosystems, both of which are affected by deforestation. Increasing run-off, raising ground temperatures, and disrupting vernal pools are just a few ways deforestation effects salamander habitat (13). The Appalachian Mountains are home to the highest diversity of salamanders in the world. These mountains range from Canada to Alabama and are home to 14 percent (14) of the approximated 618 species of caudates in the world (12). Although two thirds of this region’s land is publicly owned, a large portion is still unprotected and in the hands of private land owners (15). This habitat is vital to a plethora of species, and is currently threatened by mountain top removal (16), encroaching development (15), pollution (14) and intensive logging (15). The old growth Appalachian forests could be targeted for chopstick production in the future as the disposable chopstick industry has targeted the United States and Canada in the past. This is vital habitat for salamanders, a group of vertebrate whose populations are already in decline from other threats such as *Chytridiomycosis* and climate change.

This article hopes to not only discourage the use of wooden disposable chopsticks but also raise awareness about the uses of our dwindling resources. Disposable chopsticks are an unnecessary commodity that, much like the plastic bag, has an environmental-friendly counterpart. Disposable chopsticks cost approximately two cents a pair for restaurants and reusable chopsticks cost around \$1.17 a pair. However, reusable chopsticks have a life span of about 130 meals, making them cheaper in comparison (2).

What can you do? Bring your own chopsticks (BYOC) when dining out! Talk to your local restaurant owners about changing over to reusable/washable chopsticks. Taking a stand against disposable chopsticks now can save vital habitat not only in Asia and Russia but in the United States and Canada as well. For more information on this topic, please visit Chopsticks for Salamanders (ncaazk.org/chopsticksforsalamanders), an up-and-coming conservation initiative that hopes to raise awareness about the effects of disposable chopsticks while raising money for salamander conservation, education, and research.

References

Gardner, D. K. 2010. China's fight against disposable chopsticks. *Los Angeles Times*. articles.latimes.com/2010/aug/15/opinion/la-oe-0815-gardner-chopsticks-20100815. August 15.

Nuwer, R. 2011. Disposable chopsticks strip Asian forests. *NY Times*. October 24.

Karliner, J. 1994. God's little chopsticks. *Mother Jones*. Sept/Oct.

Stirling, J. 1997. CCMC furthering aspen as a commercial species in BC: CCMC is a pioneering company making exclusive use of high-quality aspen. *Logging and Sawmilling Journal*, Dec 1996/Jan 1997.

Spencer, J. 2008. Banned in Beijing; Chinese see green over chopsticks. *Wall Street Journal*. February 8.

Smith, A. 2011. Georgia's hottest export; Chopsticks. *CNN Money*. money.cnn.com/2011/12/02/smallbusiness/georgia_chopsticks/index.htm. Accessed Apr. 10, 2012.

Empringham, K. 2012. The Challenge of Chopsticks. *Ecobloglist*. ecoactionteams.ca/pub/blog/?p=1577. Accessed Apr. 10, 2012.

Anonymous. 1985. New Mexico exports chopsticks. *Business America* (State Export Series) 8(23):1. April 29.

Anonymous. 1987. Japanese buy USA chopsticks, *USA Today*. October 13.

Anonymous. 1989. Chopstick factory closes after picking up big debt. *Wall Street Journal*. July 20.

Straussman, M. 2011. China's hunger for chopsticks gives Georgia town a lift. *CBS News*. September 26.

AmphibiaWeb. "Species Numbers" amphibiaweb.org/amphibian/speciesnums.html Accessed April 10, 2012.

Petraska, J.W. 1998. *Salamanders of the United States and Canada*. Smithsonian Books, Washington DC.

Gratwicke, B. (ed). 2008. *Proceedings of the Appalachian Salamander Conservation Workshop*. IUCN/SSC Conservation Breeding Specialist Group: Apple Valley MN.

Kilpatrick, J., Weakley, A., and T. Massengale. 2004. *Southern Appalachian conservation assessment*. Open Space Institute.

Lindsey, R. 2007. Coal controversy in Appalachia. *NASA Earth Observatory Newsletter*.

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